DOCUMENT RESUME

ED 413 694 EC 305 963

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TITLE The Effectiveness of Early Intervention Programs in the Education of Children with Hearing Impairments.
PUB DATE 1997-00-00
NOTE 16p.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Coping; *Early Intervention; *Family Needs; Foreign Countries; *Hearing Impairments; Mothers; Parent Child Relationship; *Parent Participation; Program Content; Program Design; Program Development; *Program Effectiveness; Verbal Communication; Young Children
IDENTIFIERS *Turkey

ABSTRACT

This paper reports on a study that investigated the effectiveness of an early intervention program based on the needs of Turkish mothers of six children (ages 0-3) with hearing impairments. The program included an informational component and an educational component. During the preparation of the program, the mothers' expressed needs were taken into account. The informational program covered the following topics: the importance of the education provided to children with hearing impairments; the characteristics of sound; the reasons, classification and rating of hearing losses; resources; development of children with hearing impairments; communication with children with hearing impairments; and coping with problem behavior. The educational program was designed to prepare children for learning and to develop auditory skills as well as preverbal and verbal communication skills. Individualized educational programs were prepared for each skill and given to mothers. In addition, mothers were provided with observation forms to observe and evaluate the predetermined skills and home assignments were given. Educational videotapes were also provided to the mothers. The mothers' participation in the program was found to be a positive factor in increasing the success of the program. (Contains 26 references.) (CR)

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ED 413 694

THE EFFECTIVENESS OF EARLY INTERVENTION PROGRAMS IN THE EDUCATION OF CHILDREN WITH HEARING IMPAIRMENTS *

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ABSTRACT

This paper repors on a study which investigated the effectiveness of early intervention programs based on the needs of mothers of hearing impaired children. For this study, a pre- and post-test experimental design with a single group was used. Data were analyzed with the Wilcoxon Matched Sign Test. the subjects of the study were 6 hearing-impaired children between the ages of 0-3 and their mothers. The mothers' mean age was 29 and the children's mean age was 2.7. The mothers' educational levels were as follows: three mothers had elementary school education, one had middle school education, and two had high school education. The children had bilateral sensory-neural type hearing loss, and their mean hearing loss was 90.6 dB. Mothers in this study were not included in any other previous educational programs. As a result of the study it was found that educational programs based on mothers' needs were effective.

INTRODUCTION

In the education of children with impairments, efforts to develop early education programs have been given increasing importance in the last two decades. The infancy and preschool period is a stage of human development during which the child grows rapidly and physical, emotional and social features are formed (Peterson, 1988). Studies on early education programs and their effectiveness have been conducted since the importance of the infancy period for development has become accepted (Musselman, Wilson & Lindsay, 1988; Kargın, 1990; Minke & Scott, 1993; Sucuoğlu, 1995).

*This research supported by Ankara University

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The basic unit of an early intervention program is family. The importance given to family participation underlies an efforts to generalize the early intervention programs prepared for handicapped infants and children. Studies on direct intervention programs for handicapped infants were accelerated in the 1970s, but families' roles were interpreted differently from in today's practies. In the 1960s families were expected to play an intermediary role, and services for families with disabled children were realized in two different forms: services for the family and services for the child. Counseling techniques were used for the family services, trying to help the family accept their children's impairments and to adjust accordingly, whereas the services provided to children were planned to support the children's education and development (Robinson et al., 1988). During that period the focus of education was individualized and child-centered.

In the 1970s, the concept of family participation was re-interpreted as providing family participation in the educational program. During that period family education was intended to provide families with some basic knowledge including the nature of the handicap and its effects on the family as well as to provide guidance for the family and to teach functional language skills during daily activities at home. This family participation for hearing impaired infants necessarily needed the active participation of the families (Fitzgerald & Fischer, 1987).

As a result of these improvements in early education programs, education programs for children with hearing impairments have today gained a content which aims to provide parents with information on children with disabilities; show them behavioral methods to teach basic communicative skills (including the development of hearing, pre-symbolic communication, basic speech goals, and receptive and expressive languages); and provide them with some examples of interactions (Ling, 1984; Fitzgerald & Fischer, 1987; Nolan & Tucker, 1988; Clark, 1989, Caro & Derevensky, 1991). In addition it is accepted that, for the implementation of such programs, first of all the needs of the families must be understood and the objectives of programs must be prepared in line with such needs (Bailey & Simenson, 1988; Minke & Scott, 1993). It is suggested that early education programs based upon such rules are effective for the development of the receptive and expressive

language öf hearing impaired children (Musselman et. al., 1988; Patricia, 1991) and for the improvement of family-child interaction (Mahoney & Powell, 1988).

Services providing early education programs must prepare flexible, easily reachable programs which increase family-child interaction, in line with the needs of the family (Minke & Scott, 1993). In such services, the cooperation between the family and the specialist should include trust in the family's knowledge and skills. Furthermore, there must be an interaction between the family and the specialist, by which common goals are determined collectively and responsibilities are shared equally by depending on a reciprocal empathy and understanding. The specialists must have an effective role in decision making but they should not forget that the final decision must be given by the family (Minke & Scott, 1993). To provide the best services for children with disabilities and their families, it is necessary to determine factors such as general family characteristics, and the characteristics of family members, family structures, supports provided by the family and from outside, and the developmental levels of the disabled children. It is very important to evaluate the needs of the family in early intervention programs, for the selection of type, content, quality and method of the services provided to the family should depend upon these(Sucuoğlu, 1995).

In Turkey recent research has focused on working with disabled children and their parents. Some of this researchsconcentrates on the psychological well-being, anxiety, or stress of parents of handicapped children and of normal children with handicapped siblings (Akkök, 1989; Kuloğlu-Aksaz, 1991; Şen, 1992; Günayer, 1992). Other research is focused on the parents' acquisition of teaching strategies (Akkök, 1984; Kargın, 1990; Sucuoğlu et. al., 1992, 1993; Fışıloğlu, 1994). However, all studies conducted on children with hearing impairments at preschool and school age indicate that the involvement of parents in the children's education was very critical (Kargın, 1990) and that in individualized education programs based on the need and performance of hearing impaired children, the verbal communication skills of children are increased (Akçamete, 1986). All of these studies have emphasized the importance of the early intervention and involvement of parents in the education of hearing impaired children.

Since the parents' role is very basic in early intervention programs, the present study intends to determine the effectiveness of anearly education program based upon the needs of mothers of hearing impaired children.

METHOD

A pre- and post-test experimental design with a single group was used. The participant mothers were observed and evaluated before and after the education program.

SUBJECTS

The subjects for this study were 6 hearing impaired children between the ages of 0-3 and their mothers. The mean age of the mothers was 29 and the mean children's age was 2.7. The mothers' educational levels were as follows: three mothers had elementary school education, one had secondary school education, and two had high school education. The children had bilateral sensory-neural type hearing loss, and their mean of hearing loss was 90.6 dB. The mothers in this study had not participated in any other educational programs.

INSTRUMENTS

Two sets of data collection instruments were used. The first set of instruments was administered to evaluate the effectiveness of early education programs, whereas the second set was composed of the written and visual instruments used during application of early education programs.

I. Instruments used to evaluate the effectiveness of early education programs

1. Preliminary Information Form for Hearing Impaired Children: This form was used to record information about each child's gender, hearing loss, educational level, verbal communication skills and family structure.

2. Early Education Participation Form: This form was developed for mothers to indicate whether they wanted to participate in the early education program, their reasons for participation, and their expectations for themselves and their children.

3. Observation Form for Development of Verbal Interaction (for Parents): This form was developed by the researchers and consisted of 33 items related to the following areas:

a. Development of auditory skills

b. Development of pre-verbal communicative skills

c. Development of verbal communicative skills

All items were defined as observable aspects of behavior. Each item was marked with (+) or (-) before and after the program.

4. List of Parental Needs: This list was developed by the researchers, and consisted of five catogories consisting of 34 items selected to determine the informational needs of the mothers participating in the study. In the first part of the form, there were 9 items assessing needs for information about hearing impairments; in the second part there were 8 items about the usage of hearing aids; in the third part there were 4 items about the children's developmental features; in the fourth part there were 8 items about helping skills; and in the fifth part there were 5 items about educational possibilities for the children.

5. Form for Assessment of Verbal Communication Skills: This form was developed for mothers to observe and evaluate their children's auditory, pre-verbal and verbal communicative skill development.

II. Written and visual instruments used during early education programs

1. Outline of The Informative Program: This was a program developed to provide information for parents about their hearing impaired children's characteristics and education. During preparation of the program, the parents' needs were taken into account. The program was prepared as lessons, and at the end of each lesson mothers were asked to observe their children at home. The program covers the following topics:

* The importance of the education provided to children with hearing impairments
* Who is the hearing impaired children?
* What is sound? What are its characteristics?

* How does hearing occur?

* The reasons, classification and rating of hearing losses

* How is a hearing loss formed?

* Who provides help?

* The development of children with hearing impairments

* Communication with children with hearing impairments

* Setting, educational material arrangement and usage

* Reinforcement of behavior

* Correction of wrong responses

* Coping with problem behavior

2. Notes and Homework of the Verbal Communication Skills Development Program: This program was a comprehensive program covering areas intended to prepare children for learning and to develop auditory skills as well as preverbal and verbal communication skills. Within this program, individualized educational programs were prepared for each skill from simple to complex stages, and these were given to mothers while taking into account their children's improvement levels. In addition, "Observation Forms" were prepared for mothers to observe and evaluate the predetermined skills, and home assignments were given.

3. Video-tapes for the Education of Parents: During the informative stage of the study, mothers watched educational video-tapes prepared for the families by the researchers.

PROCEDURE

I. Pre-experimental phase

1. Mothers filled in the "Early Education Program Participation Form".

2. Each mother-child dyad was individually observed for 15 minutes. Mothers were instructed to play with their children using toys placed in the play room.

3. Observations were made by two independent observers, and inter-observer reliability was calculated (.87).

4. Data, which were consistent for the terms of basic skills and verbal skills, were transferred to the "Observation Form for the Development of Verbal Communicative Skills" as an initial evaluation.

5. After the observational stage, mothers filled in the "List of Parental Needs".

II. Experimental Phase

1. As a first stage, an "Informative Program" was prepared in line with the needs of the mothers, and this program was conducted for 5 sessions, three-hours a day, totalling 15 hours. After the informative program, mothers filled in the "List of Parental Needs" again, and these forms were evaluated.

2. At the second stage, the applications for development of verbal communicative skills were shifted. At this stage mothers participated in the educational program for 14 weeks, for one hour per week. During the first week the mothers were instructed about the purposes, contents, and parts of the program and the arrangement of settings, by the second week each mother was individually participating in the sessions. Each mother-child dyad was attended by a specialist, a co-applicant and an observer during the applications. For each session mothers were given the targeted stages of skills in a written form, and those stages were demonstrated. After each session, mothers were given observation forms and home assignments for each skill, and requested to evaluate that session.

III. Post-experimental Phase

1. During this stage, each mother-child dyad was observed in the play room for 15 minutes. Observations were made by two independent observers, and inter-observer reliability was .87.

2. Data, which were consistent for the terms of basic skills and verbal skills, were transferred to the "Observation Form for Development of Verbal Communicative Skills" as a final evaluation.

RESULTS OF THE INFORMATIVE PROGRAM:

Data were collected with the "List of Parental Needs" before and after the "Informative Program", and the difference between pre- and post-test scores were analyzed with the Wilcoxon Sign Test through the SPSS program. As a result of these analyses, a significant difference was found between two evaluations at the level of .05 ($z = -2.0226$, $P = .431$). Percentages were calculated to determine the satisfaction level of mothers' needs by the informative program.

TABLE 1
PARENTS' NEEDS INDICATED IN PRE AND POST TEST

Areas of Needs	Pretest		Posttest	
	X	%	X	%
Needs for information on the handicap	26.40	97.8	11.8	43.7
Needs for information on the usage of hearing-aid	20.8	86.7	10.6	42.2
Needs for information on developmental characteristics of children	10.8	90	5.8	48.3
Needs for information on skills of helping	23.8	99	9.6	20.4
Needs for information on present and future educational possibilities	14.8	98.7	7.2	48

According to this, the percentage of "the Needs for Information Related to the Disability" was 97.8% at the beginning, then 54.1% of these needs were met leaving 43.7% of them unanswered at the end of the program. The percentage of "the Needs for Information Related with the Usage of Hearing Aids" was 86.7% at the beginning, then 44.5% of these needs were met and 42.2% of them remained unanswered at the post-test level. The percentage of "the Needs for Information Related to the Development of Hearing Impaired Children" was 90% at the beginning, of which 78.65% were met, leaving 20.47% of them unmet at the post-test level. The percentage of mothers' "Needs for Information Related to the Today's and Future Educational Possibilities" was 98.7% at the beginning, with 50.7% of these needs being met and 48% of them remaining unanswered at the post-test level. As may be seen in Figure 1, needs for information about "Helping Skills" in the sub-group of mothers' needs for information was 99%, being the most needed

area. This was followed by "Needs for Information Related to Today's and Future Educational Possibilities" with 98.7%, "Needs for Information Related to Handicap" with 97.8%, "Needs for Information Related to the Developmental Characteristics" with 90%, and "Needs for Information Related to the Usage of Hearing Aids" with 86.7%. After the program it was observed that mothers' needs for information were related to helping skills disability, whereas needs for information related to today's and future educational possibilities were mostly met (see Table 1 and Figure 1).

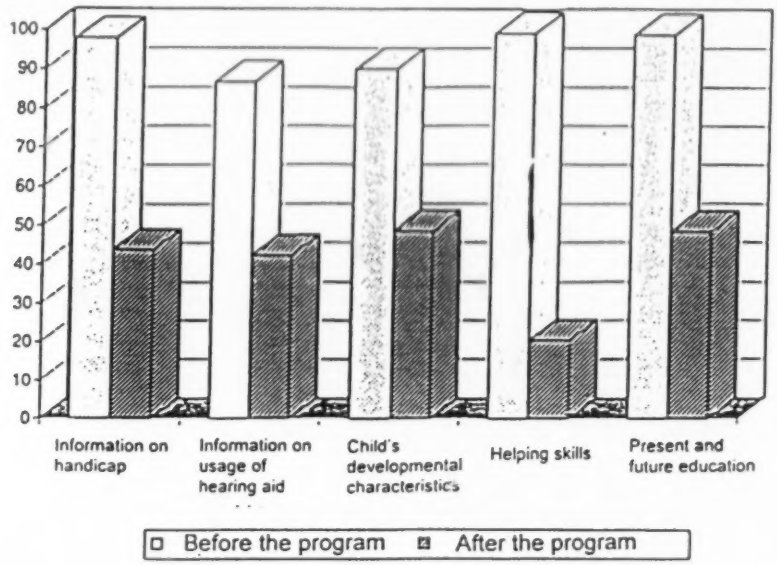

Figure 1. Changes in mothers' needs before and after the study

RESULTS OF THE VERBAL COMMUNICATION SKILLS IMPROVEMENT PROGRAM

The effects of this program on the mothers' skills to teach verbal communication to their children were assessed by the "Observation Form for Development of Verbal Communicative Skills", and the differences between pre- and post-test scores were analyzed by the Wilcoxon Sign Test. As a result of these analyses, a significant difference was found between the two evaluations at the level of .05 ($z = -2.0226$, $P = .431$) (see Figure 2 and Figure 3).

According to these results, it may be argued that the "Early Education Program" based upon the needs of mothers was effective.

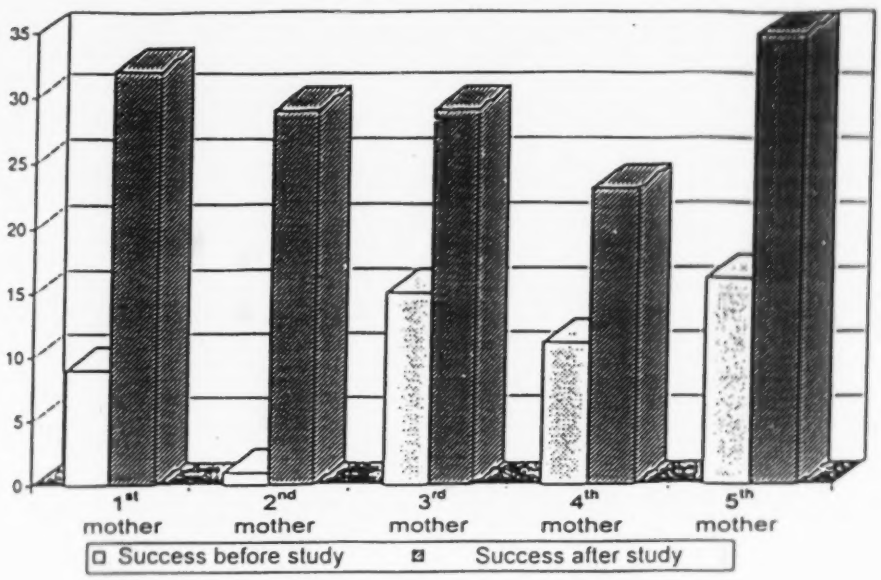

Figure 2. Changes in mothers' pre- and post study success levels

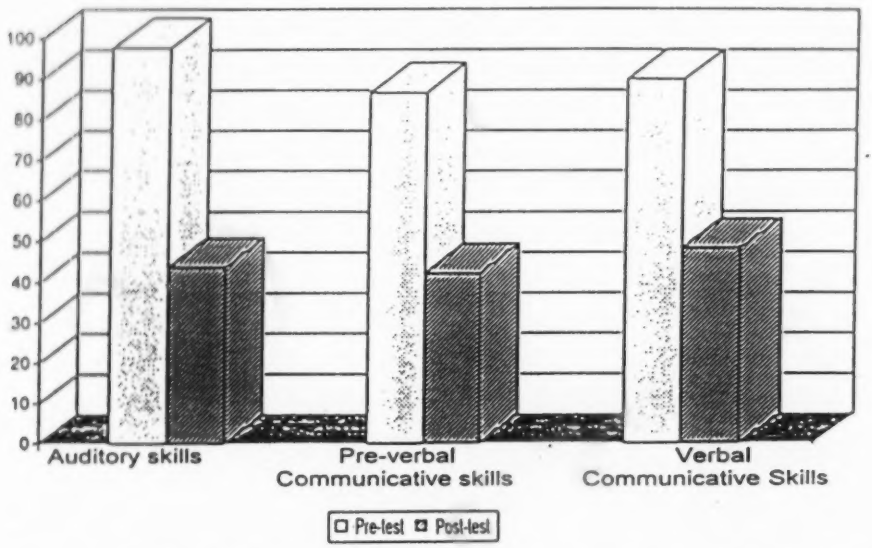

Figure 3. Changes in mothers' success levels to improve verbal communication before and after the study

DISCUSSION

This study investigated the effectiveness of an "Early Education Program" prepared according to the needs of mothers of children with hearing impairments between the ages of 0 and 3. The achievements of early education programs are closely related to the extend to which they satisfy the families' needs. Parents are confronted with two different problems when their children are diagnosed as hearing impaired. Firstly they need to acquire information about an unfamiliar impairment and secondly they experience difficulties of communication with their hearing impaired children (Moores & Meadow-Orlans, 1990). For these reasons,early education programs must be prepared in line with the needs of the parents. Many other studies also revealed that parents have benefited, been satisfied, gained self-confidence, and learned to communicate better with their children through programs prepared in line with their needs (Mahoney & Powell, 1988; Muselman et. al., 1988; Minke & Scott, 1993; Sucuoğlu, 1995). The results of this study were consistent with these findings.

Children with hearing impairments are deprived of the auditory feedbacks and motivations required for verbal communication skills. They need support, and may not develop their verbal communication skill without such support. Hearing parents' communications with their hearing impaired children are negatively affected due to such hearing losses. Studies have indicated that hearing impaired mothers approach their infants with hearing losses with more positive facial expressions, but hearing mothers approach their infants with hearing losses with neutral or negative facial expressions (Moores, Meadows & Orlans, 1990). Such conditions might prevent the hearing impaired children's development and responses. Preverbal communication must be improved before the development of verbal communication, however, and for this reason the early childhood period is very important. It is indicated in the related literature that such an education must be started during early childhood which is the critical period for language development (Kretschmer & Kretschmer, 1978). Meanwhile, it is pointed out that children could gain

verbal communication skills in natural settings with the help of their parents (Clark, 1989). This study was intended to meet the needs of mothers of information at first and then to provide them with the means to study with their children. Since the program for the improvement of verbal communication skill covered the development of pereverbal communication skills, the negative components of both mothers' and children's interactions were decreased. In addition, the mothers' active participation was also seen as a positive factor increasing the success of the program. This result is consistent with the findings of Seitz and Marcus's 1976 study which showed that mothers of hearing impaired infants failed to give verbal feedback to their children, but after an education program such failures were diminished. The findings of this study are also consistent with results showing that early intervention programs are effective in teaching mothers to show more positive facial expressions to their hearing impaired children, to give responses to their early gestures and to use eye-contact (Moores & Meadow-Orlans, 1990), and for the development of the children's expressive language. In conclusion, we may claim that "Early Education Programs" prepared in line with the needs of the mothers are effective for the education of hearing impaired children.

In this study, whether the hearing impaired children gained verbal communication skills was neither taken as a criterion nor evaluated. The mothers were required to record and evaluate their children's improvements in verbal communication skills by means of home assignments given during the experimental period of the program. Since it was a difficult and complex task to evaluate children's skills, such records were not taken into account. However, the mothers reported that their children's listening and auditory skills, as well as understanding and vocalization efforts, were increased. It may, then, be accepted that such early education programs increased verbal communication skills of hearing impaired children. On the other hand, the researchers were not able to reach a large number of subjects and therefore were not able to form a control group. To increase the validity of these findings, additional studies with larger participation and control groups may be helpful. Furthermore, studies which investigate inter-family structures, relations, communication styles, attitudes, family characteristics, demographic and other such features are needed.

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